



A FORTNIGHTLY CHRONICLE OF HIGHER EDUCATION & RESEARCH OCTOBER 15, 1979

- **Institutions & Industries**
- **Examination Reforms**
- **Population Education**
- **Autonomous Colleges**
- **Solar Energy in Agriculture and Industry**
- **Three-language Formula**
- **Workshop on Question Bank**

JAWAHARLAL NEHRU UNIVERSITY

NEW DELHI-110067

Advt. No. Aca. 111/21/79

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**B.F. Shah
I/C. REGISTRAR**

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Hony. Editor : ANJNI KUMAR

Institutions & Industries

N.V.R.L.N. Rao*

Introduction

U = [G E T]

The URGE in man is maximum GAIN with minimum EFFORT in shortest possible TIME. This natural urge in man makes him unnatural (artificial) in development of social relationships. Institutions help in the formative years of one's career to prepare for the satisfaction of basic urge. Industries are places of production of goods in abundance for human needs and promote commerce between individuals and nations and play important role in satisfying the basic urge in man.

Industrial revolution brought in importance to technical education at the cost of general education. After a century and half technical education is in utter confusion. The valley between institutions and industries began to grow wide and deep as the technology progressed. Proper understanding, co-operation and co-ordination between institutions and industries fostered for the mutual benefit and prosperity of mankind are the need of hour.

Technical institutions

The functions of technical institutions have become more difficult in the midst of unprecedented knowledge and growing specialization. The fantastic growth of knowledge is degenerating into scholarship that is incommunicable. Technological Institutions are growing to be more academic and diploma oriented instructions have become order of the day. The emphasis on diploma has resulted into complicated situations in the institutions. The training of mind, development of attitudes, enduring habits and above all character and personality are sacrificed. Ideally higher technological institutions should introduce, induce and inspire in addition to imparting basic knowledge and professional etiquette among its pupils. The output from these institutions are expected to be engineers, designers and researchers in their chosen field of activity while learning as per their needs. But the expectation of industries to have readymade stuff for immediate use for institutions is neither possible nor desirable. Allegations like uselessness of products from institutions or antiquity of industries are unwarranted and uncharitable.

It is a difficult task to draft a curricula to suit varying demands of industries. Further the period to be spent in technological institutions necessarily has to be minimum. In order to play proper role institutions should have freedom in selecting its members, faculty and pupils. They (faculty and pupils) must have necessary intelligence, interest and industry. It is due to lack of this criteria educational institutions are facing crisis.

(Continued on page 527)

*Professor of Civil Engg. Osmania University.

Examination Reforms in Kashmir University

G. H. Gurku*

In the years since independence there has been tremendous expansion of educational facilities in the State for which it deserves to be congratulated. The State has also the unique distinction of having made all education tuition free and has consistently adopted a policy of increasing the facilities for education at all stages particularly in rural areas.

Education is a double-edged tool and can be powerful instrument of social progress only if it has the proper character, coverage and quality. Therefore we need to give emphasis not only imparting of knowledge but also on stimulating and cultivating habits of self study, on the teaching of Skills, especially productive skills, on the development of rational scientific outlook and problem solving ability; on promoting creativity and self-reliance, on development of a sense of social awareness and social responsibility and on cultivation of basic human values, a secular outlook and a democratic attitude including tolerance and ability to work with others in a spirit of mutual respect and adjustment.

It is considered necessary that education should serve the dual purpose of raising the level of intellectual development of the individual and of making him a more competent agent of social change and national development. The new society will have to be based on science which is the most powerful instrument of modernization.

For the last few years, there has been much discussion about the objectives, contents and methodology of education at all levels. There is general feeling that our educational programme, right from the School to the higher level is lacking in depth and purpose. There is great rush for admission to colleges and universities but the graduates get no job for long periods. On the other hand our educational institutions seem to ignore social and economic problems of our society.

It is more painful in a poor country like ours, when it costs several thousand rupees per year, on the average, to educate a single student. On the one hand there is a considerable dearth of persons with necessary and important skills, and on the other hand there is over production of certain categories of skills which are not so much in demand. There is too much of an emphasis on more imparting of knowledge and too little attention to the teaching of essential skills and inculcation of values. The methods of teaching are largely traditional, do not use modern technology or powerful media like the film, radio and T.V. The service of these media's should be fully utilised. It will prove very useful for teaching. The best results in Television can be obtained only if there is special unit for the purpose in Education Department and the universities.

There is an increasing general dissatisfaction with the present system, among teachers and growing unrest and unemployment among students.

The people of the State are proud of having Sheikh Mohammad Abdullah as Chief Minister, who, is also holding the post of Pro-Chancellor of the two universities, Kashmir and Jammu. Since he took over as Chief Minister of the State, the Government led by him introduced many far reaching reforms in the field of Education.

A far reaching reform at both undergraduate and post-graduate has been considered the order of the day. The University Grants Commission has issued a framework of policy and the Kashmir University Committee (Tyabji Committee) thoroughly examined our programmes of study and made suggestions to improve them. It is believed that the suggestion of both the U.G.C. and the said Committee will go a long way in making education more relevant to our needs.

Examinations are of vital importance in our programme of study and they are a link between educational institutions and outside the world. On the one hand the admission to different educational institutions are governed by the results of examinations and on the other hand to a large extent employment depends on them. It has been felt that the present system of examinations will not allow the necessary broadening of the educational purpose. We need now to create such educational structure as will meet the growing and more changing needs of the people in the years ahead.

Now, in order to make the system of examinations more purposeful and to develop the intellectual level of the student, the University of Kashmir this year introduced reforms in the University Examinations and started Semester pattern of education at University level. It is believed that the system among other things will help the student to improve mode of learning. It will also help him in understanding the relevance of education in the best form both in the classroom and in the field. This new system will enable the student to face the challenges of the present day society in the meaningful manner. The new pattern of examinations is sure to enable the student to be better fitted to play good and positive role in the development of economy of the State. But the success of the new pattern of examinations is not possible without dedication and active involvement of the teachers community. Both the college and the university teachers shall have to play significant role for the success of the new pattern. The teachers who are the maker of the nation should also share the responsibilities and realise their duties. If this can be done, over the next few years, we have no doubt, that the high native talent of the people will be available in the State. □

*University of Kashmir.

Strategy for Population Education

B.V. Venkata Rao*

There has been considerable public interest in regard to the problem of growing population in the country in the past 25-30 years and the focus has been only on limitation of numbers through popularisation of various birth control measures. It is now being realised that the strategy of containing numbers in relation to resources can be more meaningful through a process of education on the implications of the problem than mere propaganda on family planning.

What can be the content of population education in school and college curricula? Soil, water, natural vegetation and animals are the basic resources for human existence. The purpose of agriculture has been the use of these resources in order to produce food, fibre, fodder and timber required for man and his animals. Increased pressure of population will naturally lead to accelerated use of these resources, leading to a situation of exhaustion or rundown. This can be illustrated with instances of over-exploitation of soil or land for the production of food and other agricultural commodities to meet the demands of increasing population.

The two approaches to increased agricultural production in any country are extension of area under cultivation and or intensification of cropping in areas already being cultivated. The former results in inroads into area under natural vegetation like pastures and forests while the latter involves more and more chemicalisation of agriculture with its attendant series of adverse effects.

In recent years, the land hunger and its politicalisation have led to indiscriminate extension of cultivation of areas under permanent vegetative cover.

Intensive agriculture with its components such as high yielding crop variety, water, fertilizers and plant protection chemicals, has its own limitations. The prosperity associated with large scale irrigation will cease to be long lasting due to a variety of causes like waterlogging, salinisation, alkalinisation and other factors. Overdrawing on natural resources whether it be, soil or water or plants or minerals or oil is bound to lead us to a situation of distress sooner than we realise.

Livestock agriculture is very exacting on land resources. It requires 3-4 times the area to feed man on animal products as against grain crops. The accent should be one of keeping animal products in our diet to a bare minimum.

The two ways of incorporating the element of population education in educational curricula are (i) identifying appropriate places in the various subjects currently taught in the programme in schools and colleges including aspects that relate to population dynamics and (ii) the development of new course on population in relation to natural resources, one at the pre-matriculate level and the other at the college level and teach the same as a basic subject, so that all students emerging out of the high schools and col-

leges are exposed to the significance of population regulation in relation to natural resources.

The Association of Indian Universities has developed a syllabus for population studies at the undergraduate level. The main aspects of the syllabus are (i) to inculcate an awareness of population dynamics including structure and distribution, (ii) factors and processes affecting population change, (iii) interrelationship of population and national development including economic, sociological, health and environmental aspects, and (iv) social policy formulation in relation to population growth. The method by which we incorporate this important aspect of knowledge into teaching at the school and college levels needs thorough attention.

Alongside of education on population problem, implementation of positive action-oriented programmes to cry a halt to the alarming growth in population, needs no emphasis. (Courtesy: *The Hindu*)

Institutions & Industries

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Industries

Industries, no doubt, have their own problems. They being commercial establishments do not wish to lose time in training personnel. But they have to have certain facilities to train personnel to satisfy their specific needs. It is also to be realised that learning is through three channels namely imitation, studies and experience. Opportunities for the first and last channel can be provided only by industries concerned. Big industries need to maintain their own training institutions to meet the requirement of personnel at various levels. The workers form base of any industry. They can be trained only on shop floor.

Many industries cannot afford to have their own research and development cells. Research and developmental activities cannot be planned in advance and they need absolute freedom to think and live which busy industries cannot afford. Therefore referring of problems by industry to institutions is of mutual advantage. This enables institutions to keep abreast with latest problems of practical importance. Patronising institutions by industries is highly desirable.

Conclusions.

In satisfying the basic urge in man the institutions and industries have a great role to play. Most important being cooperation, co-ordination through mutual understanding between the two for the prosperity of mankind. Industries need patronise institutions by referring their problems to institutions. Allegations like uselessness of products from institutions and antiquity of industries are unwarranted and uncharitable. Higher technological institutions need freedom in selecting their members having necessary intelligence, interest and industry. □

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Autonomous Colleges Experiment

D. S. Devanesan*

Tamil Nadu has been complimented for achieving a creditable first, namely, the implementation of the Kothari Commission's recommendation made over a decade ago that 50 selected colleges may be granted autonomy. Nine colleges affiliated to the Madras and Madurai Kamaraj Universities have been "liberated" so far.

The granting of autonomy to these colleges is significant as an attempt to break away from the old London model which still dominates Indian higher education even after three decades of Independence.

What has been the impact of this bold step taken by the solitary State of Tamil Nadu on the system of higher education? Have the autonomous colleges been able to project an image of their changed selves under the conditions of freedom granted to them by their parent universities which is encouraging to other institutions wanting to acquire a similar status?

The impression one gains is that "autonomy" has been hedged around with certain limitations and constraints which have dampened to some extent the early enthusiasm of the colleges eager to achieve it.

What are some of the 'constraints' about which one hears some murmurings whether they are fully justified or not?

An autonomous college has to abide by all the eligibility rules for admissions laid down by the parent university with all its socio-economic and political overtones and undertones. This is contrary to what was suggested by the Kohari Commission which included the right of an autonomous college to frame its own admission rules in its recommendations.

It is also stated that the parent universities have unwillingly made it largely impossible to breakaway from the rigid system of grouping of subjects leading to a particular degree. In other words, however much a college would like to frame courses and syllabuses after their own mind, situation and available intellectual resources, they hesitate to break away from the narrow limits already laid down for them by the existing ordinances.

As long as these ordinances apply without necessary amendments a dynamic head of a department or a brilliant professor who would like to design his own courses and cluster of subjects is likely to feel some sense of frustration. Such rigid rules make difficult the possibility of any kind of a serious interdisciplinary and interdepartmental approach in the framing of the new syllabuses under autonomy. The mere revamping of courses and syllabuses within the existing framework which keeps the arts

and the sciences apart and maintains walls of separation between departments is unlikely to produce the desired change to a more innovative and flexible system.

Another constraint mentioned is that of finance. Some of the autonomous colleges feel they are being asked to make bricks without straw! It seems clear that autonomous colleges cannot expect much additional financial help. The UGC has tried to help by assuring assistance to the tune of rupees one lakh to those autonomous colleges which submit satisfactory schemes. But the State Government is unable to do much. The financial constraint, aggravated by stern warnings against any increase in fees, is particularly hard on good private colleges which have to struggle constantly to generate more funds to maintain and surpass the standards they have established.

The feeling one gets is that the new autonomous colleges would like the universities, the State Government and the UGC to rethink their policies and attitudes to "autonomy" if there is a genuine desire that they should be pace-making agents rather than institutions with a temporary face-lift which is unlikely to last or prove attractive, academically speaking, in the long run.

In spite of these constraints the autonomous colleges seem to be involved in a brave attempt to make the best out of a not entirely satisfactory situation. How are they faring and what problems are they facing as they struggle to interpret and implement the limited autonomy given to them?

Obviously they have to be prepared to face some initial resistance from various quarters. The strength and the degree of resistance seems to depend on the extent of the communication and the quality of the enthusiasm generated when the college was in the thick of its institutional planning. Much of the response depends on whether staff and students were actively involved in the thinking and decision-making prior to the gaining of autonomy.

Some of the student fears relate to the methods of evaluation. Since the power to examine is now vested in the teachers of each autonomous college some students are apprehensive as to how just and objective they will be. This may not be quite fair to the majority of teachers but the few instances of favouritism that have come to light are enough to spark off student anxieties. They are also fearful that diversified and experimental courses may make it difficult for them to gain admission to post-graduate courses, to migrate to other universities or to get proper employment if their degrees are not of the traditional type.

The teachers have their own fears about their ability to cope with the increased load of work, whether they are adequately trained to try out new syllabuses, new teaching methods and new style examinations in which they have to be capable of facing a student who feels he has not been marked properly. And it is not only worry about satisfying individual students but a fear that malcontents will use five willing services of politically-motivated student lea-

(Contd. on page 529)

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Delinking Degrees from Jobs

M. V. Sridhara*

From the point of view of teachers and universities, the necessity for delinking degrees from jobs is fairly clear. They have had enough of the futility of teaching thousands of crib hunters, tuition goers and certificate seekers. They do not want their potential to become atrophied and sterile. Their concern is knowledge—research and teaching—and its relation to life in general (not necessarily in the sense of production of tangible goods). They would like their students to become devoted to the cause of learning as an end in itself. They expect to make their wards sound in understanding and judgment, shapely in thought and emotion and effective as citizens and leaders in an egalitarian democracy. The recipients of university education are sought to be made into decision making individuals and not mere efficient and informed instruments in the hands of some moneyed or politically powerful clever and coarse self seekers. The universities would like their alumni to become uncompromising at the sight of evil even amidst adversity and temptations. The existing state of affairs and the practices of several university men must not make us cynical and discouraged; they must not blind us to these high ideals and every effort has to be made to keep them in the focus of our vision and endeavour.

Applications of knowledge, technology, increasing and diversifying production, creation of and fitting people into jobs, assessing and paying for jobs, fixing scales of emoluments, devising promotional policies are necessarily in the nature of an incidental fall out from the work of educational institutions and universities. The latter are not their sole determinant causes. Universities cannot be held responsible for the various ills and misfortunes of society such as unemployment and unemployability, lack of human and material resources, concentration of wealth and population etc., etc. These problems have to be solved by the State, industry, agriculture and generally the people through their individual and corporate efforts. Universities can and will help them only from a distance and that too unobtrusively. Putting it briefly, the universities create an awareness of the needs and the necessary potentialities for accomplishing various developmental tasks and attempt to form and reform the outlook of men.

Universities do not have at their focus jobs and performing and designing of jobs. Instead, they have at their focus, the intellectual, moral and political values embodied in science, literature, philosophy and history. So, it is preposterous to expect these institutions of learning to work at the level of particularities and train young men in the performance of this

or that job. So, the employers (and in general, the people) will be mistaken in expecting that the universities would directly enable people to undertake the tasks of production or administration. Students with certain basic mental and physical capacities will have to be trained over a period of time and sent on to produce and to administer.

As the situation has developed and as the likelihood of developing, most of the jobs—in banks, revenue offices, sales agencies, warehousing, public relation etc., etc—do not require the knowledge one is supposed to acquire during the course of a university degree. Students who are intent upon going for any one of such jobs do not therefore evince interest in the studies prescribed in college. So, their presence in classrooms is a waste and an unnecessary burden. It hampers seriousness and undermines devotion. These features are highly infectious and have spread like epidemics destroying the purpose of universities. In view of this, selective admissions have the potentiality to make the functioning of universities effective and worth while. In the context of selective admissions into university courses, the delinking of degrees from jobs is a must.

When degrees are delinked from jobs, young men and women who are intent upon qualifying themselves for various jobs, do not turn to universities. But, they will seek opportunities in polytechnics and such other training institutes concerned with particularities and performance of specific jobs. A new type of pressure on such institutions will develop and this in turn will result in diversification and experimentation in technical and administrative training. This will not only make people employable but jobs also will be done satisfactorily and without waste.

Complementarily, universities become comparatively unburdened and are thus enabled to deal with motivated students and teachers. Their work tends to become wholesome and worthwhile. Their research and teaching will flourish better. Synoptic and critical studies can be undertaken. For want of devotion to these matters only, the universities are suffering from neglect and public disesteem. Their philosophic role requires to be resurrected. □

Autonomous Colleges

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ders keen to bring the college union into such academic matters.

All this suggests that autonomous colleges are passing through their birth pangs. But they may render a great service to the cause of higher education by striving patiently to make the experiment a success in Tamil Nadu. Perhaps the nine autonomous colleges should begin meeting together to share their experiences and to make the State Government, the UGC and general public aware of the problems involved in their pioneering situation. □

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Systems Approach for Science Study

K. M. Chandrashekar

Perhaps one of the deplorable features of twentieth century culture is its increasingly schizoid nature—intellectuals trained in the humanities can no longer comprehend what the scientists are talking about and scientists do not seem particularly concerned about anything so long as their laboratories keep going and the research grants keep flowing in. This is because the scientist's universe of discourse no longer overlaps that of the poet or historian: what to a poet, or canny politician, is Mother India, is merely a bit of what was Gondwanaland to a geologist; and even Mother Earth, to an astronomer, is merely a planet in the vicinity of a G. type dwarf star. The absence of common universe of discourse dooms all efforts at bridging the gap between the "two cultures" to failure.

If we sense that the schism must not be allowed to grow, one of the first steps would be to introduce compulsory courses in the sciences at the undergraduate level. These courses, which could be in various disciplines—Physics, Biology, Mathematics, etc—must be common to all college entrants (who would be free to choose a course out of the available set), whether they intend to specialize in the sciences or not. Only in this way can we build up a common, basic vocabulary. This requires that the course be sufficiently rigorous to hold the attention of would-be scientists and, at the same time, not be so taxing as to repel would-be scholars in the humanities. This is certainly a demanding task, but perhaps one that a creative instructor will enjoy.

Prof. Gerald Holton introduced one such course in Physics at Harvard University in the early seventies. Taught to first and second year students, the course covered such topics as Galilean and Newtonian Mechanics, the Conservation of Mass and Energy, Origins of the Atomic Theory, and Relativity Theory. But the feature of the course was a term-paper on a set theme. "The impact of the Newtonian Synthesis on X in the eighteenth century," where X stood for philosophy, theology or political science or literature—whichever was of greatest interest to the student. Prof. Holton reports that "students call this essay a high point of the course", and that they come to realise that cohesive links do exist between two fields of scholarship. Some of the topics taken up by the students have interesting looking titles—for example: "The conception of order in English Poetry before and after Newton", "The effect of science on legal theory", "Use of mechanics in arguments from design as a proof of God's existence in eighteenth century theological discussions." Prof. Holton stresses the fact this excursion into realms traditionally not part

of Physics did not detract from the soundness of the scientific content of the course. And further, he adds that such a course depends "primarily on the attitude of the instructor and only secondarily on the quality of the student."

It may be noted that this innovation in the teaching of science represents, in essence, a "Systems" approach, for the systems approach attempts to see facts in wholes rather than in bits and pieces; it stresses relationships rather than information *per se*. And it may be that only this kind of perspective can lend coherence to the apparent chaos of twentieth century culture.

But the billion-dollar question, of course, is this: "Can such a course be successfully run in India?" The answer, as Prof. Holton points out, lies with the instructor. Reading material and bibliographies will have to be compiled. And the instructor will have to seek assistance from faculty members outside his field of specialization. *En passant*, it may be noted that there are very interesting correspondences between scientific thought and ancient Indian modes of thought, as Fritjof Capra explains in his brilliant book, "The Tao of Physics". These are inter-relations which deserve to be more deeply explored and widely known.

The result of such a course could be deeply rewarding both to the instructor and the students: a Weltanschauung that is richly interconnected. And this in turn could make for tolerance and a less chauvinistic view of life.

[Courtesy: The Hindu]

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Need for development of science and technology

Scientific and technological knowledge has become so vast and complicated that it is no longer possible for politicians or the general public to understand fully the implications of scientific discoveries and technological innovations without the help of scientists and technologists themselves. And it is also impossible for those who hold political power to exploit science and technology for political purposes unless the scientists and technologists are willing to go along with them. Plato talked of philosopher-kings. The world of today needs philosopher-scientists who possess the insight and imagination to understand the impact of science and technology on society- environment and the fate of the human race so that its blind advance is guided by social and world responsibility. The assertion of this social responsibility by scientists might well determine whether the world is moving towards a new age in which mankind will realize the dreams of prosperity, happiness and peace, or whether it will hurtle towards the destruction of civilization, the environment and the human race itself.

The danger of war and of the annihilation of civilization through the use of nuclear weapons is a well-worn theme. But people are becoming increasingly insensitive to this danger. There is no passion and piety in the demand for disarmament and the abolition of nuclear weapons. There is no voice as that of Jawaharlal Nehru being raised constantly and vibrantly against the danger of war, and warning as he did at the Belgrade Conference of Non-aligned Nations that unless this main problem is solved "no other problem remains: they are submerged in the terrible disaster of war". It is time disarmament, especially nuclear disarmament, got the highest priority in international diplomacy.

One remarkable thing is that while the nuclear powers go on piling up and sophisticating their nuclear arsenal, they are pressurising and preventing others, who desperately need nuclear energy for peaceful purposes, from acquiring and developing this vital source of energy. They talk about nuclear-free zones in areas where there are actually no nuclear weapons. In any case

what is the rationale for a nuclear-free zone in a region which is exposed to atomic radiation from tests conducted without inhibition in the neighbourhood, which could be traversed by testing inter-continental missiles, and which is on the fringe of a vast ocean where nuclear-powered ships and submarines of the super-powers contend for global influence? One depressing fact of international relations today is that the majority of nations and of the population of the world has become ineffectual in regard to disarmament and discussions on disarmament. It would appear that if a nation does not enter the nuclear club, it would have no effective say on this vital question on which hangs the survival of mankind.

India, as you know, is committed to the development of atomic energy for peaceful purposes. The other day I happened to read a speech that Jawaharlal Nehru made in Bombay on June 26, 1946 in which he referred to the use of the atom bomb on Japan by the United States. After pointing out that by unleashing such a weapon the United States of America created a dangerous situation, he said: "As long as the world is constituted as it is, every country will have to devise and use the latest scientific devices for its protection. I have no doubt that India will develop her scientific researches and I hope Indian scientists will use the atomic power for constructive purposes. But if India is threatened, she will inevitably try to defend herself by all means at her disposal. I hope India, in common with other countries, will prevent the use of atomic bombs". It is refreshing to note that Nehru had a very lively awareness of the needs of India's security even before he assumed the office of the Prime Minister.

After he became Prime Minister, Nehru solemnly declared that India would use atomic energy only for peaceful purposes. "So far as we are concerned", he said in Lok Sabha on August 10, 1960, "we are determined not to go in for making atomic bombs



Shri K.R. Narayanan, Vice-Chancellor of Jawaharlal Nehru University delivering the convocation address at the IIT, Bombay.

and the like. But we are equally determined not to be left behind in the advance in the use of this new power. It is true that in the ultimate analysis a country which has atomic power fully developed can use it for good or evil purposes. And no declaration which I can make today will necessarily bind people in future, but I do hope that we shall create an atmosphere in this country which will bind every government in future not to use this power for evil purposes". Every government after the time of Nehru has reiterated this commitment to use atomic energy only for peaceful purposes, and has also re-emphasized its determination not to be left behind in the use of this new power.

To have freedom to develop nuclear energy for peaceful purposes is the hall mark not only of our technological independence but also of our political and economic independence. In the heyday of imperialism and colonialism, under-development in Asia, Africa and Latin America, was a direct consequence of the industrialisation and development of a small number of centres in Europe. These advanced centres dominated the colonial world by exchanging their technology and financial capital for raw materials and markets. The story is more or less the same today as pointed out by Francisco R. Sagasti. According to him, science and technology are becoming "the principal means through which a few industrialized countries will maintain and reinforce their domination over the Third World". With the rapid advance of space travel and the immense cost and sophistication of scientific research, the danger of technological hegemonism by a few countries, indeed by a power elite in a few countries, over the rest of the world is now a possibility.

Science and technology has only widened the historic gap between the developed and developing nations. It has been estimated that 95% of the world's expenditure on science and technology and 90% of the world's scientists and technologists are today concentrated in the industrialized

countries. The Third World countries command only 2% or 3% of the world's R & D resources. An added factor is that more than 50% of the world's budget on science and technology is directed towards the improvement of weapons and armaments. This massive misdirection of scientific and technological resources has not only contributed to the maldevelopment of world society but produced a new phenomenon that might be described as technological imperialism.

At the heart of the North-South division and the struggle for a new international economic order is the question of scientific and technological development. It is clear that the developing nations cannot tackle their gigantic problems of poverty, population, housing, malnutrition, disease etc., without the acquisition and development of scientific knowledge and technological know-how. We have also learned by experience that just like social and political institutions, technology cannot be blindly transferred from the advanced countries and transplanted in the developing countries. There is a lot of talk today of 'appropriate technology', 'the recovery and development traditional technologies', and the evolution of 'an endogenous' scientific and technological base, for meeting the challenge of development. Gandhian and Maoist approaches have been some times invoked in this context.

There is no doubt that small technologies and the upgradation of traditional technologies have an important and appropriate role to play in developing societies. Mass education along basic lines, primary health programmes for the people using 'barefoot doctors' or their counterparts, housing through the use of local materials and simple designs, low-cost mass-transport systems, improvement of agriculture through application of scientific methods—all these are relevant and essential. The Peoples Republic of China adopted such methods under Mao-Ze-Dong and have not abandoned them even today,

though they are trying to adapt them to changing conditions. The point that is often ignored is that the Chinese never neglected heavy industries—in fact the major share of investment after the Liberation went to heavy industries and not to agriculture, and sophisticated fields of science and technology like nuclear and space science received the highest priority in China. And today they are engaged in one of the most dramatic and massive attempts in history for the importation of science and technology from outside. I am not saying that either the small, self-reliant, model of technological growth attributed, not very correctly, to China or the current policy of China to import technology on a massive scale, is a model for the developing countries. What is clear is that in this rapidly changing world we cannot over-emphasize one or the other, and that both small technology and high technology are appropriate, if selected and applied to suit the actual conditions of a country; I would say that a mixed technology like mixed economy is both a fact and a necessity. It is necessary for us to climb the commanding heights of science and technology, if we are to give to the millions of our people the common benefits of small technology and if we are not to be left behind in the new technological revolution. Advance in basic theoretical aspects of science is as important as the application of science to the problems of economics and society. In China they have realized that they made a mistake in neglecting fundamental scientific studies during the Cultural Revolution and they are now trying to make up for it.

It is obvious that the development of fundamental sciences and its technological application go together, and that there should be some basic balance between science and society, between technology and culture, between knowledge and psychology, and between know-how and values. Science and technology have to be brought within the ambit of social control and responsibility
(Continued on page 540)

Need for three-language formula stressed

Shri Morarji Desai, former Prime Minister of India, inaugurated the diamond jubilee celebrations of the Dakshina Bharat Hindi Prachar Sabha held recently in Madras. In his address he called upon the propagators of Hindi to simplify the language so that it could become popular soon. He pointed out how Sanskrit, the richest Indian language, could not become the common language because it was difficult to learn.

Reiterating the need for a three-language formula, the former Prime Minister said that every Indian should learn Hindi besides mother-tongue and English. This would make the language simpler

said that English should continue to be taught in the schools as it would enable the country to maintain its link with the rest of world. He added that Article 351 of the Constitution required that the development of Hindi should reflect the composite culture of the country and the language should absorb the style and words from Sanskrit and all other languages. Translations from Hindi to other Indian languages and vice-versa would enrich Hindi and make it popular.

Madras Varsity to restructure courses

The Madras University proposes to restructure the BA &

carry marks comprising two components, continuous internal assessment by the college and external valuation by the university.

The Vice-Chancellor of the University, Dr. G. R. Damodran said that orientation courses would be held in a few months time so as to enable the college teachers to fulfil the objectives of the new restructured degree courses. A broad based education has been the ultimate objective and adequate flexibility has been provided thus enabling the students to break away from traditional combinations of subjects.

Workshop on question bank at Vallabh Vidyanagar

As part of its examination reforms programme, the Sardar Patel University organised a four-day workshop on 'Design and structure of question papers at the undergraduate level' at Vallabh Vidyanagar recently. In his opening remarks, Shri V. Natarajan, Project Officer in the Association of Indian Universities, said that the core of examination reforms lay in framing effective questions because 'as you ask, so you test'. He suggested a typical question paper which would have three parts, namely, (1) objective type questions; (2) short answer questions; and (3) essay type questions. He also suggested that fixed time could be allotted for answering each part.

Shri Natarajan emphasised that the question paper should be so designed as could test the various abilities of the student such as memory, comprehension, analytical power, computational ability and so on. He pointed out that before framing a particular question, the teacher should have a clear idea as to what specific ability he wanted to test through that question.

Referring to the objective type questions in the case of arts subjects, Shri Natarajan maintained that such questions could also be prepared in languages and literature but the teachers had to be fully acquainted with the subject.

The participants in the work-

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and richer. He also pleaded for a large inter-mingling of Hindi and non-Hindi people to facilitate fusion of ideas and evolve a better understanding. He wanted the regional language to be the medium of instruction from the primary school to the Ph. D. level but the study of Hindi should be encouraged to promote national integration.

Delivering the convocation address at the Sabha, which synchronised with the jubilee celebrations, the Karnataka Governor, Shri Govind Narain, said that Hindi speaking states should immediately adopt three-language formula so that the burden of learning the third language was borne equally in all parts of the country. Even if any southern state was not willing to implement the three-language formula for any reason, the northern states should adopt it immediately in order to strengthen national and cultural integration. Shri Narain

BSc courses from the academic year 1980-81. Under this new arrangement there will be six parts for both BA and BSc. Part I comprises the study of Tamil or other modern or classical languages and Part II includes English. Part III consists of two core courses at the advanced level and in Part IV the study of either one core course of four semester duration or two core courses of two semester duration each (both at the ordinary level) will be taken up. Part V comprises study of supporting courses. Community and Social Service is also being continued in the restructured degree courses and students have to get a satisfactory certificate from the heads of the institutions for having done the work.

A total of 29 papers have to be taken by the candidates during the six semester course and of this four papers will figure under examinations conducted by the college itself. Each paper will

shop were divided faculty-wise and subject-wise. Various ways of framing questions were discussed and question banks were prepared in different subjects. Steps would be taken to translate into practice the recommendations made at the seminar.

About 215 participants from the postgraduate departments of the university and from affiliated colleges attended the workshop.

Convention of chemists at Kurukshetra

Shri H.S. Brar, Governor of Haryana inaugurated a five-day convention of chemists at the Kurukshetra University. In his address, Shri Brar stressed the need to give scientific training to every student to enable him to appreciate and imbibe this discipline of thought and develop a scientific way of thinking. He felt convinced that the chronic problem of poverty in the country could not be solved without the aid of modern science. Scientific thinking could be of immense value to national development, he added.

Prof. J. Shanker of the Bhabha Atomic Research Centre, delivered the presidential address. He said that universities were the most suitable places for undertaking problems connected with national development. He stressed the need to organise extension work in the university on a large scale so as to bridge the discrepancy between what the science students do in their classrooms or laboratories and the problems they face in everyday life. He also spelt out the role of university teachers and researchers and said that the primary function was to discover new facts, create new knowledge and develop such processes in order to produce products needed by the society.

The convention was sponsored jointly by the Indian Chemical Society, the CSIR, the DST, the Department of Atomic Energy and the Institute of Chemists and was attended by 600 delegates including eminent scientists and researchers from all over the country.

Teachers' day celebrated at Mangalore

Speaking at the Teachers' Day celebrations in Mangalore, the Vice-Chancellor of Mysore University, Prof. K.S. Hegde, said that the present system of education was a highly evolved one and gave ample freedom and choice to choose the type of education to suit one's attitude. He asked the parents and teachers to be a little more patient and sympathetic towards the rebel youth as their behaviour was symptomatic of the changing values of life. Prof. Hegde however pointed out that there should not be any compromise in basic values like honesty, discipline and truthfulness. He felt that it had been the endeavour of education throughout to have conformity with the accepted values and ideals of the civilisation of the time.

In his paper on the education system, Shri K.D. Kini, Principal, Bhuvanendra College, said that neither the teacher nor the student was doing well in the present system. While the teachers were utterly inefficient and incompetent, the students were frustrated and disappointed and the social conditions too were not conducive for their healthy growth. Striking a note of self-analysis, he said the dismal picture could be improved and bright days could be seen as the glorious heritage of teacher student relation was still existing in the country and felt that the nation could depend upon this tradition once again to come out of the mess.

New educational strategy suggested

Inaugurating the NAEP programme at Hyderabad, the Andhra Pradesh Governor Shri K. C. Abraham, called for a new educational strategy for a more fruitful involvement in the developmental programme. He said that the objective of the new strategy should be to create an awareness among the rural people about their socio-economic situation and to bring amelioration through their individual efforts. Referring

to the progress of the NAEP in the state, the Governor said that it had reached the take-off stage having completed the preliminaries. He said there was a need to prepare the people psychologically for the adult education programme by creating a positive and favourable learning situation and added that the success of the programme depended largely on the coordinated efforts of various other departments.

Shri B. Venkatram Reddy, Education Minister of the State, said that adult education and drive against illiteracy was an off-shoot of the national movement and adult education had become a facet of national struggle.

The Minister hoped that about 8000 adult education centres would be set up in the state by the end of the year.

New feed for livestock evolved

Under the lab to land programme of transferring technology to the villages, the scientists of the Haryana Agricultural University have taken up a project of balanced feeding of livestock with a view to assessing the nutritional status of dairy animals. The survey conducted by the scientists has revealed that the animals in the state were getting insufficient quantities of protein. A mixture of molasses, urea, minerals and vitamins has been formulated and the required quantities of this feed are mixed with cereal straws of 'kadbi' which is then fed to the animals. This feed has found favourable response from the farmers. The scientists claim to have eroded some of the old notions in the minds of the livestock owners that cotton seed feeding to milch buffalo resulted in higher fat and milk production. Scientific studies have shown that this notion is not tenable and feeding of a ration containing cottonseed cake is as good as a ration having cottonseed. The university has also started a programme of cottonseed cake feeding to bring home to the farmers that the cottonseed cake has an edge over cottonseed.

Firm educational policy suggested

Inaugurating a three-day national conference of the All-India Federation of University and College Teachers Organisation in Bombay recently, Shri M. C. Chagla, an eminent jurist and former Union Education Minister, said that frequent change in the educational policy had resulted in waste of time and national resources. He felt that a firm national education policy must be evolved. Since the teachers played an important role in nation building, they must have a say in the formulation of the education policy.

Shri Chagla regretted that university education had become merely a status symbol and suggested that colleges should not be increased without maintaining a high standard of education and other facilities for it. He added that the student-teacher ratio must also be maintained.

He said English must be retained as the medium of instruction in higher education for the country's growth in the field of science and technology. English brought to our doorstep the wonders of science and technology.

Institute of natural law and order inaugurated

An Indian Institute of Natural Law and Order has been set up in Kurukshetra. The objective of the institute is to explore the sociological and jurisprudential aspects of the science of creative intelligence and transcendental meditation.

The institute was inaugurated by Justice M.H. Beg, former Chief Justice of India at the Kurukshetra University auditorium recently. In his address, Justice Beg said that the approach of natural law was a potent approach to the problems of law and order in every walk of society. He stressed the need to devise a new method and approach to attain a higher level of consciousness which would relieve men of destructive tendencies. He further spelt out the various implications of natural law and order.

Natural law, he said, was based on the principles which produced order. Natural law necessarily presupposed that there was something like unnatural law which produced disorder, anarchy and disharmony in the society and all efforts should be sincerely directed to remove the hurdles hampering the order. He suggested that the solutions to the problems of corruption, exploitation of the weak by the strong and nuclear arms lay within man's consciousness.

Maharshi Mahesh Yogi who blessed the newly formed Institute said that the basic assumption which underlined the natural law was to promote individual progress without creating hindrance in the progress of other individuals. He added that the formation of an Institute of Natural Law and Order was the intention of time, the whisper of present times and the need to devise practical mechanics in the field of jurisprudence or in other fields of learning was all the more necessary in the contemporary world when all types of systems of government had failed to achieve this goal.

Mr. Justice V.R. Krishna Iyer of the Supreme Court, who is also the President of the Institute, said that the conflict between good and evil, right and wrong, could not be resolved with the aid of legal law or any other external agency but with the approach of natural law. Justice Iyer said that he believed in recognising the infinite talent of every person and developing it to the maximum degree of divinity.

UGC project on tourism

The University Grants Commission has initiated its first pilot project on pilgrimages and tourism in Garhwal Himalayas for scientific planning and development action programmes. In the first phase the project will establish findings on the status of age-old pilgrimages, principal data on old pilgrim demographics and psychograph their attitudes and desire. The project will also prepare an inventory of recreation-

cum-cultural resources in scenic attractiveness, landscape-perception, floral and faunal excellence and cultural and natural heritage areas which would be preserved for the posterity and bench-marks for the scientists.

The second phase programme will be aimed at establishing network on transport and other tertiary services needed for the promotion of tourism and the third phase programme will deal with the study of impact of the activity on recreational and religious landscape.

The Director of the Institute of the Himalayan Studies of the Garhwal University has been named as the Chief Investigator of the project and the services of an ecologist, cultural anthropologist, geographer, sociologist, cartographer and a photographer would also be utilised in the successful completion of the project.

The UGC has also sanctioned a project of writing textbooks on tourism. This would be the first book on the subject to meet the growing need of the emerging discipline.

Training course on agriculture and rural development

The North-Eastern Council, Shillong, in collaboration with the Indian Institute of Management, Ahmedabad, organised a two-week training course on management of agriculture and rural development. The course was attended by twenty participants from the States and Union Territories.

The Secretary of the North-Eastern Council, Shri K.M. Mirani, said that the best contribution which the NEC made for the region was by way of providing them trained manpower. He hoped that the officials who had attended the course would, on their return to their respective states, use the training for proper benefit of the masses and that the State Governments in future would also be deputing officials for attending similar course.

Refresher course for English teachers

The regional centre of the Central Institute of English and Foreign Languages located at Shillong proposes to conduct a refresher course for the benefit of English teachers of colleges and universities who have not attended any summer institute or English Language Teaching Course and are interested in familiarising themselves with the recent developments in linguistics and language teaching. The course will consist of lectures, tutorials and would cover the subjects of (i) Linguistics; (ii) English grammar and usage; (iii) phonetics and spoken English; and (iv) problems of teaching English as a second language at the college and the university level.

Research centre at Kashmir

The University of Kashmir has decided to set up a Centre of Research for Development in the university so as to plan, coordinate and undertake scientific and technological research and development work intended to assist in the economic development of the region. There will be a separate Board of Research Studies for the Centre for implementing the programmes.

GAU undertakes research and training in pulses and oilseeds

The Indian Council of Agricultural Research has sanctioned two schemes of research and extension training in pulses and oil seeds at Derol, Rajkot and Baroda districts falling under the jurisdiction of the Gujarat Agricultural University. These schemes would involve an estimated expenditure of Rs. 21.36 lakhs and would help in boosting the production of pulses and oilseed crops in Gujarat to a significant extent.

Panel to review NAEP

The Government has set up a committee to review the national adult education programme. The committee will suggest steps for strengthening NAEP which was launched a year ago. It will also identify the weaknesses in the

programme and examine its different technical aspects. It will also go into the question of its funding.

The committee will be headed by Dr. D.S. Kothari, an eminent educationist and the other members include: Dr. Malcolm S. Adiseshiah, Shri J.P. Naik, Shri B.G. Verghese and Shri Habin Tanvir. The committee is expected to submit its report within four months.

Course on photography at Madurai

The Youth Welfare Department of the Madurai Kamaraj University proposes to organise a 7-day course on photography for the students of the colleges affiliated to the university during January and February 1980. During the course, techniques of photography, developing, printing, enlarging, retouching, etc. will be taught through practical sessions. Chemicals and solutions would be provided free and no fee for the course would be charged.

Kurukshetra organises camps for rural reconstruction

Under the programme of youth for rural reconstruction, the NSS unit of Kurukshetra University organised camps and the students of its affiliated colleges undertook the construction of boundary walls of village schools. They also completed the earth work on village approach road. Women students taught the women folk various crafts like stitching, knitting and sewing. They also worked on the local tirthas for their beautification, environmental improvement and tree plantation around them.

In all 1453 students participated in the camping programme sponsored by the Ministry of Education and Social Welfare in collaboration with the Government of Haryana.

University centre at Tellicherry

The Calicut University proposes to set up its centre at Tellicherry soon. About 60 hectares of land has been acquired and a sum of Rs 4 lakhs has been made available by the University Grants Commission for the purpose.

Panel for public relations course

The Mysore University has appointed a committee to study and advise the university on introducing public relations and tourism courses at the postgraduate level. Shri T.N. Narasimhamurthy, a member of the senate, has been appointed as the Chairman of the committee and Prof. Nadig Krishnamurthy, Head of the Journalism Department and Shri S. Pattabhiraman are the other members of the committee. The Chairman has been authorised to coopt two more members.

Agricultural fair at IARI

The Indian Agricultural Research Institute organised a two-day Krishi Vigyan Mela in New Delhi recently to educate the farmers about how best to make up for the widespread loss of kharif crop on account of drought conditions in most parts of the country. The fair laid emphasis on the cultivation of rabi crops like wheat, gram, mustard, etc. and the farmers were acquainted with the latest high-yielding varieties of wheat in particular.

Other highlights of the fair included display of the high yielding varieties of rice which the IARI had developed in recent years; display of new production technology for pulses and oilseeds; five new hybrids of bajra which were helping to increase the production of this rainfed crop in a very significant manner; and the method to develop algae, a substitute for the costly chemical nitrogen fertilisers.

UP universities to stick to admission schedule

The Uttar Pradesh Minister for Higher Education has announced that all universities in the State would stick to the last date of admissions fixed for the next session with a view to ensuring that examinations were completed latest by April or May. He said that all the vice-chancellors were informed accordingly.

The Minister also said that boycott of examinations or mass copying would not be tolerated and revaluation of examination papers would be allowed only in deserving cases.

Solar energy in agriculture and industry

India has begun in a limited way making use of solar energy in various fields, including agriculture and industry.

In agriculture solar energy is being used mainly for drying crops. At Annamalai University in Tamil Nadu, a paddy dryer has been constructed with one tonne capacity. It has a nine-day flat plate collector and an electrically-driven pump. Experiments have shown that the flat plate collector can dry moist grains even with fluctuating amounts of sunshine.

The College of Agricultural Engineering at Jabalpur, in Madhya Pradesh, is also using a solar powered blower. This is a black-painted cylindrical stack placed at the focal point of concentrator.

The Central Salt and Marine Chemicals Research Institute at Bhavnagar, in Gujarat has built a solar cabinet dryer which can dry magnesium carbonate at a cost of Rs. 400 a tonne, while drying by electricity costs Rs. 2,000 a tonne.

Indian scientists have also tested four types of solar cookers:

—Wooden hot box which is lined with blackened metal, has a top consisting of double-glazed solar panels with an adjustable silvered glass reflector. Summer and winter trials have shown that most dishes can be cooked within three hours. The maximum temperature achieved is 78 degrees celsius.

—Solar oven which employs a well-insulated cooking chamber with a double glazed top and eight silvered glass reflectors. The maximum temperature reached was 350 degrees celsius in summer and 250 degrees celsius in winter.

—Solar steam cookers use the heat from the sun to heat water circulating in a flat plate collector, and then pass it through a double-walled cooking chamber containing three food compartments. These cookers are slow and take up to two and a half hours to boil rice.

—another type of cooker uses an aluminium parabolic reflector to focus sunshine into a black-bottomed cooking pot. The reflector needs regular adjustments to match the movement of the sun.

Roorkee University scientists have designed, built and tested a solar ice-making machine using ammonia/sodium thiocyanate. It can produce two kilograms of ice a day at minus 5 degrees celsius.

Scientists at the Bharat Heavy Electricals Limited and the Indian Institute of Technology (Madras) have designed, in collaboration with the West German concern MMB, a 10 kilowatt solar thermal power plant for use in the rural areas. It produces electricity at 220 volts.

ICMR plans new strategy to curb diseases

Dr. V. Ramalingaswami, Director-General of the Indian Council of Medical Research said that the ICMR was proposing to launch massive programmes to take its medical technologies direct to the people and get the people themselves involved in the application of these technologies in an effort to curb diseases in the community. The Council had also decided to give high priority to large scale application of the numerous medical technologies already developed by the Council's scientists. He added that the Council would therefore work towards bridging the gap between knowledge and action in addition to conducting basic bio-medical research in frontier areas.

The new strategy Dr. Ramalingaswami said, would take the ICMR scientists away from ivory tower research to actual work in the disease-stricken communities. To start with the Tuberculosis Chemotherapy Centre in Madras would adopt some villages with a high incidence of the disease. Its scientists would work with doctors in the primary health centres and demonstrate

the value of the tuberculosis control technologies already developed at the ICMR.

ICMR scientists at the Vector Control Research Centre at Pondicherry would move out to villages to demonstrate mosquito control measures through environmental improvement and by the use of large-eating fishes in ponds and wells. The village people would be actively involved in the work.

The National Institute of Nutrition in Hyderabad and the Institute for Research in Reproduction in Bombay would also take their technologies to the rural people.

Prof. Ramalingaswami said that the ICMR was also trying to involve medical scientists all over India in the formulation of research programmes for the ICMR.

Need for food security system

Delivering a memorial lecture in Madras, Dr. M.S. Swaminathan, Secretary in the Ministry of Agriculture and Irrigation, said that food security system was the most urgent need in the country and the country had to ensure that no one's physical or mental growth was affected for lack of food or by malnutrition. He outlined a five point programme to implement the food security system. He said that the needs of the system were ensuring protection to ecological infrastructure, appropriate technology, building grain reserve and improving post-harvest technology, social security and nutrition education.

He said degradation of ecological infrastructure would ruin the future and a public awareness should be created to protect it. Under an appropriate technology stability of production and stability of income to the landless should be ensured. The available human energy should be made use of to have a pivotal role in our system.

Dr. Swaminathan said that more attention should be paid to the qualitative aspect of stored grains. Unless the quality aspect was ensured we would be doing a great damage to the already under-nourished and malnourished people by inflicting diseases.

A list of Doctoral Theses Accepted by Indian Universities

PHYSICAL SCIENCES

Mathematics

1. Bahadur, Neera. Investigations in the theory of geometric structures and their foliations. University of Delhi.
2. Bhaskara Rao, Kotikalapudi. On some problems in wave propagation in micropolar elastic solids. Andhra University.
3. Gurdarshan Singh. On wave propagation in non-homogenous viscoelastic media. Punjabi University.
4. Ratnam Naidu, Sakuru Venkata. Studies in complete inner product spaces and applications to self dual manifolds. Andhra University.
5. Sharma, H.K. Contributions to the fixed charge problems. Indian Institute of Technology, Kanpur.
6. Vaidya, Darshana. Multiplier problems of vector valued Segal algebras. Indian Institute of Technology, Kanpur.
7. Veerabhadraiah, R. Non-steady and steady flows in a porous medium. Bangalore University.

Statistics

1. Muddapur, Mahadevayya Veerayya. Some topics in stochastic processes. Karnatak University.

Operational Research

1. Patkar, Vivek N. Contributions to geometric programming. University of Delhi.

Physics

1. Bhalla, Ravi Kumar. A Study of the 8 MeV track microton and its beam energy measurement using E.E. scattering. University of Poona.
2. Elunalai, K. Molecular constants of some XY_n type molecules by kinetic constant method and mass dependence of coriolis coupling constants. Sri Venkateswara University.
3. Gupta, Prabha. Quantum mechanical study of collisions of electrons with atoms and molecules. Meerut University.
4. Kalani, S. Studies on some effects of impurities in crystals. Madurai, Kamaraj University.
5. Kundu, Mohanlal. Crystal structure of potassium dipicrylamine and molecular configurations of some salts of dipicrylamine. University of Burdwan.
6. Mehta, Shobha. X-ray K-absorption investigation of some complexes of cobalt. University of Indore.
7. Narayan, Ramesh. A new approach to the compressibility of ions of ionic crystals. Bangalore University.
8. Parabrahma Reddy, P. Spectroscopic investigations on certain transition metal ions in calcium and strontium tartrate tetrahydrate single crystals. Sri Venkateswara University.
9. Sharma, Jagdish Chandra. Theory of first, second and third order strain derivatives of dielectric constants of ionic crystals. Agra University.
10. Sharma, Krishna Kumar. Spectroscopic studies of some aromatic molecules. Indian School of Mines, Dhanbad.
11. Soman, Shreepad Trimbak. Studies on optical absorption and dislocation density in electrolytically coloured pure and doped alkali halides. Nagpur University.
12. Supekar, Sunil Bhattachandra. Dielectric investigation of bioelectric materials. University of Indore.

Chemistry

1. Chakraborty, Manisha. Solvent extraction of Zirconium with sulfoxides. Utkal University.
 2. Chakraborty, T.K. Kinetic studies on oxidation of some organic sulphur compounds. University of Jabalpur.
 3. Chandra Ballabha. Studies in the preparation of 6-Amino Penicillanic acid and its utilisation in the synthesis of potentially useful analogues of Penicillins. Meerut University.
 4. Dharmadhikari, Dattatray Mahadeo. Structural and electrical properties of Franklinite and related oxides. Nagpur University.
 5. Jain, Ramesh Chand. Studies on block and graft copolymers of diones with vinyl monomers. Agra University.
 6. Kapadia, R.N. Studies on osmotic membranes. Saurashtra University.
 7. Khunt, V.N. Studies on optical activity. Saurashtra University.
 8. Makhijani, Santosh Dayaram. Studies on some metal chelates in solution. Nagpur University.
 9. Mishra Madan Gopal. Studies on some new inorganic ion-exchangers. Jiwaji University.
 10. Prasanna Chith, B.S. Studies on metal complexes: Spectro-photometric, pH metric and polarographic study of resacetodhenone oxide complexes of Ti, V, Cr, Mn and Ni. Sri Venkateswara University.
 11. Rastogi, Yogesh Chandra. Studies in kinetics and mechanism of oxidation of substituted hydroxy acetophenones and their methyl ethers by leadtetraacetate. Agra University.
 12. Rathi, Umesh Kumar. Physico-chemical studies of complexes with substituted hydroxy acetophenones and oxime. Agra University.
 13. Sahni, Gitika. Study on 'Inhibin'—A postulated anti-FSH principle of testicular origin: Isolation, purification and characterisation. Agra University.
 14. Saxena, Suresh Chandra. Kinetic study of silver catalysed oxidation of L-hydroxy monocarboxylic acids, dl-atrolactic isobutyric, mendelic and benzilic acid by potassium peroxydisulphate. Agra University.
 15. Sharma, Anil Kumar. Chemical components of Dalbergia sissoo pods and sensitized photooxidation of chalcones. University of Delhi.
 16. Sharma, Dalip Singh. Electro-chemical aspects of the interaction of tri- and tetraphosphates with yttrium, lanthanum and gadolinium cations. University of Delhi.
 17. Shrivastava, Santosh. Studies in metal complexes of some oximes and related Schiff's bases. Jiwaji University.
 18. Sirohi, Satendra Jit Singh. Kinetics and mechanism of oxidation of phenols by $Ce(IV)$. Meerut University.
 19. Venkatachalapathi, K. Studies on the determination of stability constants of binary and ternary complexes of chromium (III). Sri Venkateswara University.
- #### Earth Sciences
1. Muley, Mahesh Vasudeo. Geology of the graphite deposits of Gujarat State with special reference to their occurrence, origin beneficiations and industrial application. M.S. University of Baroda.
 2. Rangaraja, S. Stratigraphy and sedimentology of the Siwalik Molasse in a part of Panjab Sub-Himalaya. University of Delhi.

Engineering and Technology

1. Athappan, R.M. Structure and catalytic activity of $\text{NiO-Al}_2\text{O}_3$ systems. Indian Institute of Technology, Kanpur.
2. Dutta, Swapan Kumar. Studies on effect of ultrasonics on the rate of diffusions. University of Burdwan.
3. Nambiar, K.R. Treatment of high nitrogenous wastes by flocculating algal-bacterial system. Indian Institute of Technology, Kanpur.
4. Ramekkrishna, R. S. Some iterative techniques in digital image restoration. Indian Institute of Technology, Kanpur.
5. Sinha, S.N. Two dimensional laminar and turbulent separating flows over backward facing steps and rectangular cavities. Indian Institute of Technology, Kanpur.

BIOLOGICAL SCIENCES

Marine Biology

1. Gopalakrishna Pillai, N. Microbenthos of a tropical estuary. University of Cochin.
2. Mohan, M.V. Studies on the teredinids of Cochin harbour. University of Cochin.
3. Remani, K.N. Studies on the effect of pollution with special reference to benthos in Cochin backwaters. University of Cochin.

Botany

1. Barik, Sudhakar. Role of microorganism in the degradation of pesticides in soils. Utkal University.
2. Bhatnagar, Ashok Kumar. Morphology and embryology of some taxa of controversial affinities. University of Delhi.
3. Chauhan, Govind Singh. Genetical analysis of quantitative characters in *Vigna unguiculata* (L) Walp. Jiwaji University.
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6. Katiyar, Kamlesh. Palyonoligcal studies of Rosales. Gauhati University.
7. Nandkar, Pralhad Barsuji. Observations on the algae growing in polluted water. Nagpur University.
8. Nazma. Studies on the durability and anatomy of certain woods: A few dicotyledonous taxa. Andhra University.
9. Padhi, Balabhadra. Studies on the variability in *Pyricularia oryzae* Cav., the fungus causing blast disease of rice. Utkal University.
10. Patil, Hachchappagouda Shantappagouda. Studies on the comparative ecology of the various species of algae with a view to select the best for increasing the efficiency of sewage oxidation ponds. Karnatak University.
11. Sarojini Menon, V. Algal physiology: Some aspects of relationship between mitochondria and chloroplasts. Madurai, Kamaraj University.
12. Thakur, Deep. Population differentiation in *Boerhaavia diffusa* Linn. Jiwaji University.
13. Tuteja, Subhash Chander. Vegetational studies of Sheopur-Kalan and S. Balgarh Tehsils of Morena District (M.P.). Jiwaji University.
14. Ugemuge, Nana Kamaji. Flora of Nagpur District with special reference to medicinal plants and embryological observations on *Acacia*, *Mucuna* and *Psoralea*. Nagpur University.
15. Upadhye, Vitthalrao Eknath. Morphological studies of the Deccan intertrappean flora of Mohaonkalan, M.P., India. Nagpur University.
16. Verma, Satish Kumar. Morphological studies in the family Acanthaceae. Meerut University.

Zoology

1. Bhattacharjee, Aloka Ashit Baran. Early development of the genital tract in staged human embryos. Nagpur University.
2. Deshpande, Sudhakar Vithalrao. Studies in Coleoptera with special reference to scarabaeoid fauna of Marathwada Region. Marathwada University.
3. Ghare, Dilip Nagorao. Studies on the biology of the cestode parasites of birds in Maharashtra. Marathwada University.
4. Huilgol, Narayan Venkatrao. A study on the effects of certain chemicals on some fresh water forms. Nagpur University.
5. Kotak, Vibhakar Chunilal. Certain histoenzymological and endocrinological observations on the reproductive cycles of the Indian feral blue rock pigeon, *Columba livia* G. M.S. University of Baroda.
6. Koundinya, P. Ranganath. Studies on physiological response of the fresh water telecast, *Tilapia mossambica* (Peters) to pesticide impact. Sri Venkateswara University.
7. Subbiah, G.N. Thermobiological studies in the developmental tissues of a polikilotherm. Madurai Kamaraj University.
8. Vijayakumar, Munshi. Effects of nuclear polyhedrosis virus of the armyworm, *Mythimna* (*Pseudalactia*) *separata* on albino rats. Karnatak University.

Medical Sciences

1. Murthy, Dwarkanath K. Investigations on the effects of some drugs in laboratory animals: A cytogenetical approach. Osmania University.
2. Parekh, K.S. Antibacterially, pharmaceutically active substances from marine sources. Saurashtra University.

Agriculture

1. Dabholkar, Arvind Rangarao. Inheritance of resistance to seed moulds caused by *Curvularia lunata* in *Sorghum bicolor* (L) Moench. University of Indore.
2. Daulta, Bharpur Singh. Studies on some breeding investigations and establishment of early selection criteria in grapes, *Vitis vinifera* L. Haryana Agricultural University.
3. Giri, Gajendra. Grain yield and moisture use efficiency of dryland wheat as affected by use of mulch and transpiration suppressants. Agra University.
4. Pawar, Dattatraya Harischandra. Effect of antitranspirants, straw mulch and leaf stripping on growth, yield, moisture use and uptake of nutrients by hybrid sorghum, *Sorghum bicolor* (L) Moench under dryland conditions. Marathwada Agricultural University.
5. Shrivastava, Sukh Ram. Genetic analysis of yield and its components in linseed, *Linum usitatissimum* Linn. Jawaharlal Nehru Krishi Vishwa Vidyalaya.
6. Verma, Sohan Lal. A study on fluorine accumulation in plants in relation to crops, variety, fertility level and soil amendments. Haryana Agricultural University.

Veterinary Science

1. Ayyagari, Veerebhadru. Evaluation of intrapopulation selection methods and additive and non-additive gene effects of egg production in chickens. Agra University.
2. Bansal, Rajendra Pal. Studies on development of tissue culture Rinderpest vaccine using lamb kidney cell culture system. Agra University.
3. Harpeet Singh. Comparative genetic structure of different grades of Holstein Zebu crossbred cattle. Agra University.
4. Khoda, V.K. Genetic studies of wool traits in Muzafarnagari sheep. Agra University.
5. Sadhana Kumari. Rumen microbes in relation to urea feeding. Agra University.

Additions to A. I. U. Library

- Agochiya, Devendra. *Youth leadership in India*. Delhi, Vishwa Yuvak Kendra (c1978) 111p.
- Agruso, Victor M. *Learning in the later years: Principles of Educational Gerontology*. New York, Academic, 1978. ix, 149 p.
- Ashby, Eric. *Reconciling man with the environment*. London, Stanford, 1978. vii, 104p.
- Astin, Alexander W. *Preventing students from cropping out*. San Francisco, Jossey-Bass, 1977. xv, 204p.
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- Biehler, Robert F. *Psychology applied to teaching*. Boston, Houghton Mifflin (c1972) xiv, 873p.
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- Cochran, William G. and Cox, Gertrude M. *Experimental designs*. New York, Wiley (c1957) xiv, 611p.
- Davis, Bernard D. and Flaherty, Patricia, ed. *Human diversity: its causes and social significance*. Cambridge, Ballinger (c1976) xiv, 248p.
- DeRebello, Daphne M. *Formal schooling and personal efficacy*. Delhi, Sterling, 1979. xix, 151p.
- Evans, Ellis D. *Transition to teaching*. New York, Holt, Rinehart and Winston (c1976) xi, 156p.
- Ginzberg, Eli. *Manpower connection: Education and work*. Cambridge, Harvard University press (c1975) 258p.
- Glaser, William A. *Brain drain: Emigration and return: Findings of a UNITAR multinational comparative survey of professional personnel of developing countries who study abroad*. Oxford, Pergamon, 1978. xlvii, 324p.
- Hamlyn, D.W. *Experience and the growth of understanding*. London, Routledge and Kegan Paul, 1978. 158p.
- India. Ministry of Education and Social Welfare. *Working group on universalisation of elementary education: Interim report*. Delhi, Author, 1978. 27p.
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- Lakdawala, D.T. *Optimum utilisation of educational expenditure in Gujarat*. Ahmedabad, Sardar Patel Institute of Economic and Social Research, 1978. 269p.
- Ness, Frederic W. *Uncertain glory: Letters of cautious but sound advice*. San Francisco, Jossey-Bass, 1977. xii, 154p.
- Paris, OECD. *Creativity of the school: Conclusions of a Programme of Enquiry*. Paris, Author, 1978. 165p.
- . *Education policies and trends: A report*. Paris, Author, 1977. 44p.
- . *Inter-sectoral educational planning*. Paris, Author, 1977. 307p.
- . *Public expenditure on education*. Paris, Author, 1976. 98p.
- . CERI. *Innovation in in-service education and training of teachers: Practice and theory*. Paris, Author, 1978. 63p.
- Peters, R.S., ed. *John Dewey reconsidered*. London, Routledge and Kegan Paul, 1977. viii, 128p.
- Reading, Hugo F. *Dictionary of Social Sciences*. London, Routledge and Kegan Paul, 1977. 231p.
- Rieke, Richard D. and Sillars, Malcolm Osgood. *Argumentation and the decision making process*. New York, Wiley (c1975) vii, 312p.
- Scheffe, Henry. *Analysis of variance*. New York Wiley (c1959) xvi, 477p.
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Convocation Address

(Continued from page 532)

and made to minister to the needs and aspirations of man instead of helping to consolidate historic inequalities and creating new and explosive dichotomies in the world. One would go further and plead for a human face for science instead of its aggressive mechanical face or its abstract formless face that alienates it from people and society. Science needs to be popularized and a little prettified, if I may say so. The sense of wonder to which Einstein referred has to be restored to science, and the

creations of science have to be invested not with fear and horror but with a sense of social utility and a touch of the aesthetic. Robert Louis Stevenson in one of his essays talked of the magic of electricity and wrote that a sedate electrician sitting somewhere in a backroom pushes a button "and all the street lamps burst forth suddenly into song". Is it too idealistic to imagine that a creative writer of the future will talk of nuclear energy in the same vein. One thing seems to be certain, unless science and techno-

logy are integrated to the needs, values and aspirations of man and regulated, in a very broad sense and not in the sense of interference with the freedom of research, by the organised will and purpose of society it might well turn out to be a mindless, formless monster let loose in a defenceless "global village".

[Excerpts from the convocation address delivered by Shri K. R. Narayanan, VC, JNU, at the IIT, Bombay.]

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**UNIVERSITY OF JABALPUR
JABALPUR**

Advertisement

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Applications are invited on the plain paper for the following posts, viz:

(1) Professors

One each for Mathematics, Biological Sciences, Economics and History and Ancient Indian History in the scale of pay of Rs. 1300-50-1500-75-1800-100-2000.

(2) Readers

One each for Mathematics, Chemistry, Political Science and Physics in the scale of pay of Rs. 1100-50-1600.

(3) **Lecturers

One each for Biological Sciences, Economics and Physics in the scale of pay of Rs. 620-40-900-50-1400.

**Essential Minimum Qualifications
For Professors and Readers**

(a) (i): A Doctor's degree or published work of an equivalent high standard; and

(b) (i): A 2nd Class Master's degree in a relevant subject with at least 50% marks (B in the seven point scale) or an equivalent degree of a foreign University, and

N.B.: (i) While taking into account the marks/grade, the marks/grade obtained in internal assessment, if any, shall be excluded.

(ii) At least 50% marks at the Bachelor's degree examination, the basis on which division is awarded at the degree level by the University; and

(iii) At least 50% marks at the Higher Secondary/Intermediate/Pre-University Examinations, as the case may be; and

(c)(i): In the case of professors the experience of teaching of post-graduate classes shall be at least 10 years and in the case of Readers the experience of teaching post-graduate classes should be at least 5 years; and

(ii): In case of professors evidence of candidates having been awarded a doctor's degree under his supervision and in the case of Reader at least three years experience of guiding research.

For Lecturers

(a)(i): A doctor's degree or published research work of an equivalent high standard; and

(b)(i): A 2nd Class Master's degree in a relevant subject with at least 50% marks (B in the seven point scale) or an equivalent degree of a foreign University; and

N.B. (While taking into accounts the marks/grade, the marks/grade obtained in internal assessment, if any, shall be excluded).

(ii) At least 50% marks at the Bachelor's degree examination on the basis of which division is awarded at the degree level by the University, and

(iii) At least 50% marks at the Higher Secondary/Intermediate/Pre-University Examination, as the case may be.

Having regard to the need for developing inter-disciplinary programmes, the degree in (a) and (b)(i) above may be in relevant subjects.

N.B.: 1. The requirement regarding minimum percentage of marks shall be relaxed upto 5% in case of scheduled Caste/Scheduled Tribe candidates.

2. The posts of Reader in Mathematics and Lecturer in Economics are temporary for the present, but are likely to continue.

**3. For the post of Lecturer in Biological Sciences, those who possess M.Sc. degree in Botany and Zoology may also apply.

Desirable Qualifications

(a) For Professor in Biological Sciences

(i) Specialisation in any branch of Botany/Zoology, preferably in Cytology, Genetics, Evolution, Microbiology, Ecology, Fungal Physiology, Medical Mycology, Cell Biology, Physiology (Plants/Animals).

(ii) Sufficient experience of organising and running post-graduate teaching laboratories.

(b) For Reader in Chemistry

Area of research reaction mechanism with experience in modern instrumentation.

(c) For Reader in Physics

The post is meant for experimental solid States Physicist with specialisation in 'Charge Storage and Transport properties in Solids' and 'Semiconducting properties of Organic Solids'. The candidate is expected to be well-versed with the recent advances in these fields.

(d) For Lecturer in Biological Sciences

Specialisation in any branch of Biological Sciences.

(e) For Lecturer in Physics

The post is meant for experimental Physicist with specialisation in 'Surface Structure and hardness properties of Crystals'. The candidate should be well trained in the use and maintenance of NU 2 research microscope, high vacuum coating unit, crystal growing units and the related experimental set up.

Qualifications are relaxable in cases of candidates of exceptional merit. Names of eminent persons distinguished in scholarships who do not apply may also be considered for selection. The candidates in their applications should give details of their 'Specialisation' if any. Canvassing in any form by or on behalf of the candidates will disqualify him.

The applications showing the details of qualifications stated above along with the information regarding the proof of the date of birth and past experience accompanied with a postal Order for Rs. 5/- in the name of the undersigned should reach here not later than 26th October, 1979. The

candidates already in employment at present should send their applications through proper channel.

REGISTRAR

**MARATHWADA
AGRICULTURAL UNIVERSITY
PARBHANI
CORRIGENDUM**

Read Advertisement No. MAU/2/79

dated: 10th September, 1979

1. The maximum age limit for the posts at Sr. No. 27 to 34, 36, 38 to 45 and 47 to 51 will be 30 years instead of 25 years.
2. Last date for receipt of applications for the posts at Sr. No. 21 and 32 will be 31st December, 1979 instead of 12th October, 1979.
3. The last date for receipt of applications for all other posts is extended upto 26th October, 1979.

Other conditions remain the same.

Concerned are requested to take a note of this change.

REGISTRAR

**ALL INDIA INSTITUTE OF
MEDICAL SCIENCES**

ANSARI NAGAR,
NEW DELHI-110016

Advertisement No. 4/79 Estt. I

Applications will be received by the Director, All India Institute of Medical Sciences, New Delhi from the Indian citizens upto the 14th November, 1979 on the prescribed forms available on request for the following temporary posts:

1. Professor

One each for (i) Haematology (ii) Clinical Pathology and (iii) Pharmacology.

Pay

(i) Rs. 2400-100-2500-125/2-3000 inclusive of N.P.A. for Medical Officers.

(ii) Rs. 1500-60-1800-100-2000-125/2-2500 for Non-Medical Officers.

Note: For the post of Professor of Pharmacology both medical and non-medical candidates will be considered.

2. Associate Professor

Two for (i) Microbiology and one each for (ii) Paediatrics (iii) Reproductive Biology and (iv) two for Surgery.

Pay

(i) Rs. 2000-75-2525 inclusive of N.P.A. for Medical Officers.

(ii) Rs. 1480-60-1900 for Non-Medical Officers.

Note: For the post of Associate Professor of Reproductive Biology both Medical and Non-Medical candidates will be considered.

3. Assistant Professor

One each for (i) Biochemistry (i) Pathology (Tropical Medi-

cine) and (iii) Haematology (Blood Transfusion).

Pay

(i) Rs. 1700-60-2060 inclusive of N.P.A. for Medical Officers.

(ii) Rs. 1200-50-1300-60-1600 for Non-Medical Officers.

Note: For the post of Assistant Professor of Biochemistry both medical and non-medical candidates will be considered.

4. Lecturer

One each for Forensic Medicine (ii) Dental Surgery and (iii) Three for Anaesthesiology including one for Cardio-Thoracic Centre.

Pay

Rs. 1400-60-1760 inclusive of N.P.A.

Note: The post of Lecturer in Forensic Medicine is sanctioned for the Post Mortem Project financed by the Delhi Administration temporary for the duration of the project.

5. Senior Biochemist

One (Reserved for S/Castes candidates).

Pay: Rs. 1100-50-1600.

6. System Analyst

One (Reserved for S/Tribes candidates).

Pay: Rs. 1200-50-1300-60-1600.

7. Senior Scientific Officer (Biophysics)

One (Reserved for S/Castes candidates)

Pay: Rs. 1100-50-1600.

8. Senior Research Officer

One

(for Human Nutrition Unit)

Pay: Rs. 1100-50-1600.

9. Research Officer (Biostatistics)

Two

Pay: 700-40-900-EB-40-1100-50-1300.

Note: One post of Research Officer is for Churu Distt. Project, Rajasthan.

10. Audiologist

One

Pay: Rs. 840-40-1000-EB-40-1200.

11. Application Programmer

One

(For Computer Facility)

Pay: Rs. 700-40-1000-50-1600.

12. Operator (for Computer Facility)

One

Pay: Rs. 650-30-740-35-880-EB-40-960.

13. Junior Research Officer (Non-Medical)

One

(for Hospital Administration)

(Reserved for S/Castes candidates).

Pay: 650-30-740-35-880-EB-40-960.

14. Assistant Stores Officer

One

Pay: Rs. 550-25-650-30-740-35-880-EB-40-1040.

15. Technical Supervisor (Veterinary)

One (Reserved for S/Castes candidates).

Pay: Rs. 550-25-750-EB-30-900.

16. Draftsman Grade-III

One (Reserved for S/Tribes candidates).

Pay: Rs. 260-6-290-EB-6-326-8-366-EB-8-390-10-400.

17. Dark Room Assistant

One (Reserved for S/Tribes candidates).

Pay: Rs. 260-6-290-EB-6-326-8-366-EB-8-390-10-400.

18. Plumber

One (Reserved for S/Tribes candidates).

Pay: Rs. 260-6-326-EB-8-350.

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Pay: Rs. 330-10-380-EB-12-500-EB-15-560.

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Upper Age Limit

50 years for teaching posts and 30 years for non-teaching posts relaxable for Government servants Scheduled Castes and Scheduled Tribes candidates or otherwise exceptionally qualified candidates. Upper age limit up to 5 years is relaxable in the case of S/Castes and S/Tribes candidates.

Note

(i) Scheduled Castes and Scheduled Tribes candidates called for interview will be paid travelling allowance as per rules of the Institute.

(ii) The essential qualifications are relaxable at the discretion of the Selecting Authority.

Application forms and detailed information sheets can be obtained personally or on written requests accompanied by a self addressed stamped (0.60 paise) envelope (23 × 8 cm.).

ALL INDIA INSTITUTE OF MEDICAL SCIENCES

ANSARI NAGAR,

NEW DELHI-110016

Advertisement No. 5/79 Estt. I

Applications will be received by the Director, All-India Institute of Medical Sciences, Ansari Nagar, New Delhi-16 from Indian citizens up to the 31st October, 1979 on the prescribed forms available on request for recruitment to the following temporary posts for deputation to the Institute of Child Health, Kabul:

1. Assistant Professor

One each for (i) Paediatric Surgery (ii) Orthopaedic Surgery (iii) Surgery and (iv) Anaesthesiology.

Pay Scale

Rs. 1700-60-2060 inclusive of N.P.A.

2. Medical Records Officer

One Post.

Pay Scale

Rs. 550-25-750-EB-30-900.

The incumbents of the above posts are likely to be deputed to Institute of Child Health, Kabul initially for a period of one year, which is likely to be extended from time to time but not

exceeding three years. Their deputation to Institute of Child Health, Kabul will be governed by the terms and conditions finalised by the Ministry of External Affairs from time to time under the I.T.E.C. Programme. In addition to salary, other allowances/facilities as prescribed by the Ministry of External Affairs under the I.T.E.C. Programme would be admissible.

On their reversion from Institute of Child Health, Kabul the term of recruitment of the incumbents of the aforesaid posts will stand terminated and the All-India Institute of Medical Sciences will have no responsibility to absorb them on their reversion from the Institute of Child Health, Kabul.

Upper Age Limit

50 years for teaching posts and 30 years for non-teaching posts relaxable for Government servants and S/Castes and S/Tribes candidates or otherwise exceptionally qualified candidates. Upper age limit upto 5 years is relaxable in the case of S/Castes and S/Tribes candidates.

Application forms and detailed information sheets can be obtained either personally or on a written request accompanied by a self-addressed stamped (0.60 paise) envelope (23 cm × 8 cm).

**PANJAB UNIVERSITY
CHANDIGARH**

Advertisement No. 22/79

Applications are invited for the following posts so as to reach the Registrar, Panjab University, Chandigarh, by 19th November, 1979 along with postal orders of Rs. 10/- each:

1. Reader in Sanskrit (Research).....I.
(Pay Scale: Rs. 1200-50-1300-60-1900) at VVBIS and IS, Hoshiarpur.

Qualifications

Essential

(i) A first or high second class Master's degree of an Indian University or an equivalent qualification of a foreign University in the relevant subject viz., Sanskrit, with bright academic record;

(ii) Either a research degree of doctoral standard or published research work of high standard in the subject concerned in journals of repute in Vedic language and literature.

(iii) About five years' experience of teaching Post-graduate classes and or research in Vedic Language and literature.

(iv) Competence to guide research.

Desirable

Knowledge of French, German and Avestan.

2. Reader in Library Science.....1.

(Pay Scale: Rs. 1200-50-1300-60-1900) at P.U. Library, Chandigarh.

Qualifications

Essential

(i) A first or high second class Master's degree of an Indian University or an equivalent

qualification of a foreign University in the relevant subject with bright academic record;

(ii) Either a research degree of doctoral standard or published research work of high standard in the subject concerned in journals of repute;

(iii) About five years' experience of teaching Post-graduate classes and/or research; and

(iv) Competence to guide research. Evidence of being engaged in making innovation in teaching methods and production of standard teaching material, will be an additional qualification.

Candidates who do not possess a doctoral degree are required to submit 10 Typed/Cyclostyled copies of brief resume of their published work.

Persons already in service should route their applications through proper channel. Incomplete forms and those received after the due date will not be entertained. Serving employees, may however, send their applications on the prescribed proforma direct to the University. They may route another copy through their department. They will be allowed to present themselves for interview only on the production of a 'No Objection Certificate' from their employers. Canvassing in any form will disqualify a candidate.

Application forms can be obtained from the Cashier, Panjab University, Chandigarh, personally on payment of Rs. 2/- or by making a written request to the Finance and Development Officer, Panjab University, Chandigarh, accompanied with self-addressed stamped envelope of 23x10 cms. and a postal order for Rs. 2/- drawn in favour of the Registrar, Panjab University, Chandigarh.

UNIVERSITY OF RAJASTHAN JAIPUR

Advertisement No. 10/79

Applications are invited (through proper channel in case of those who are already in employment) so as to reach this office on or before Wednesday the 31st October, 1979 in the prescribed form available from the Registrar's office on pre-payment of Rs. 4/- (Rs. 3/- extra in case required by post) for the undermentioned posts (including the posts in the Institute of Correspondence Studies and Continuing Education):

1. Professors

In the scale of Rs. 1500-60-1800 - 100 - 2000- 125/ 2- 2500. Tagore Professor in History and Indian Culture—1 and Professor in History—1; Public Administration—1; Business Management—1; Mathematics—1 and Jain Studies—1.

2. Readers

In the scale of Rs. 1200-50-1300-60-1900. Hindi—3, Modern European Languages

(German—1, Music—1, Public Administration—1, Political Science—1, Philosophy—1, Geography—1, Psychology—1, Sociology—2, Dramatics—1, Economics—1, Business Management—1, Law—1 and Education—1.)

(The above posts of Readers include one post each in the subjects of Hindi, Economics, Public Administration, Sociology and Education for the Institute of Correspondence Studies and Continuing Education and the same are temporary but likely to be made permanent).

3. Lecturers

In the scale of Rs. 700-40-1100-50-1600. Modern European Languages (Russian—1, Philosophy—2, Sanskrit—4, Economics—5, Geography—1, History—6, Psychology—1, Public Administration—2, Dramatics—3, South Asia Studies Centre—1, Persian—1, Journalism—2, Statistics—1, Zoology—2, Business Administration—7, Business Management...1 and Education) 10.

(The above posts of Lecturers are inclusive of the vacancies in the Institute of Correspondence Studies and Continuing Education. These are Sanskrit-1, Economics-3, History-2, Public Administration-2, Journalism-2, Business Administration-5 and Education-10, and the same are temporary but likely to be made permanent).

4. Case Analyst

In the scale of Rs. 400-40-800-50-950.

5. Research Associates

In the grade of Rs. 700-40-900-EB-40-1100-50-1300. Economics-1, History...3, Sociology-1 and South Asia Studies Centre...2.

6. Director

Institute of Correspondence Studies and Continuing Education...1 in the Scale of Rs. 1500-60-1800- 100- 2000- 125/2- 2500 (Temporary but likely to be made permanent).

7. For Special Assistance Programme in Philosophy

(i) Reader in Indian Philosophy-1 In the Scale of Rs. 1200-50-1300-60-1900.

(ii) Lecturer in Philosophy of Law/Philosophy of Science-1. in the grade of Rs. 700-40-1100-50-1600.

(iii) Research Associates

Indian Philosophy-1, Logic and Philosophy of Science-1 and Philosophy of Law/Social Philosophy, Political Philosophy/Moral Philosophy-1, in the scale of Rs. 700-40-900-EB-40-1100-50-1300.

8. For University Leadership Project in Political Science

(temporary but likely to be made permanent):

(i) Reader-1 in the grade of Rs. 1200-50-1300-60-1900.

(ii) Lecturer (Translation)-1 in the grade of Rs. 700-40-1100-50-1600.

9. For University Service and Instrumentation Centre

(Temporary but likely to be made permanent)

(i) Senior Scientific Officer-1 In the grade of Rs. 1100-50-1600.

(ii) Scientific Officer-2, in the grade of Rs. 700-40-900-EB-40-1100-50-1300.

The details of qualifications etc., may be obtained alongwith the prescribed application form or separately as the candidates may desire. The benefits of Provident Fund, D.A. and other allowance will be admissible as per rules of the University. Candidates desiring to apply for more than one post must send their separate application for each post. Candidates will be called for interview at their own expense. Incomplete applications shall be rejected without making any reference.

Persons who have already applied in response to University Advertisement Nos. 9/78, 1/79, 6/79, 7/79 need not apply afresh (except for the following posts:

Professor—History, Public Admn., and Bus. Management.

Reader—Economics, and Public Administration.

Lecturers...South Asia Studies Centre, Zoology and Business Admn. Special Assistance Programmed in Philosophy—Reader in Indian Philosophy.

University Leadership Project in Pol. Sc....Lect. in Translation). They should intimate to the University that they are—still desirous to be considered for the post applied for on the basis of their earlier application sent in response to the aforesaid advertisements. They may also send the particular of their additional qualifications and experience etc. acquired since then on plain paper by 31st October, 1979.

The University reserves the right to alter the number of posts in any cadre or subject. Higher start may be given to deserving candidates. Selected candidates are liable to be posted in any unit of the University. The University may consider anyone for appointment as Professor though he may not have applied for the post.

Persons who resorted to unfair means at any examination and were punished therefor OR were convicted by a Court of law for any offence involving moral turpitude, are not eligible to apply. Retired persons also need not apply.

REGISTRAR

NORTH-EASTERN HILL UNIVERSITY

LOWER LACHAUMIERE, SHILLONG-1.

No. Advt/P-7/79

Dated 28th September, 1979.

Applications are invited for the following posts in the College of Agriculture, Ghaspani (Medziphema), Nagaland:

Sl. No.	Post	No. of vacancy	Pay
1.	Lecturer in Agriculture Botany (Plant Breeding and Genetics).	1	Rs 700-40-1100-50-1600/-
2.	Lecturer in Agriculture Zoology and Entomology (Entomologist).	1	Rs 700-40-1100-50-1600/-
3.	Lecturer in Chemistry and Soil Science (Soil Scientist).	1	Rs 700-40-1100-50-1600/-
4.	Lecturer in Agriculture [Engineering]	1	Rs 700-40-1100-50-1600/-
5.	Lecturer in English	1	Rs 700-40-1100-50-1600/-

Essential Qualification

(Sl. No. 1, 2, 3, 4 and 5)

- A consistently good academic record with at least 1st or high second class (B in the Seven Point Scale) at the Master's degree in a relevant subject or an equivalent degree of a foreign University; following a good degree in Agriculture.
- An M Phil degree or a recognised degree beyond the Master's level or published work indicating the capacity of a candidate for independent research work.

Desirable

Serial No. 1

Plant Breeding and Genetics

A Doctorate in Plant Breeding, Agricultural Botany or Genetics and Plant Breeding or published work of a high standard in the subject.

Serial No. 2

Entomology

A doctoral degree in Entomology or published work of an equally high standard or at least three years teaching experience in an Agriculture University or Agriculture Degree College.

Serial No. 3

Soil Science

A Doctoral Degree in Soil Science.

Serial No. 4

A Doctoral Degree in Agricultural Engineering.

Candidates appointed should be prepared to serve anywhere within the jurisdiction of the North-Eastern Hill University, although presently they will be posted in Medziphema District, Kohima.

Applications on plain paper indicating name, present address, age, qualifications in detail, etc., etc., should reach the undersigned on or before October 30, 1979, together with an Indian Postal Order for Rs 5/- (Rs 2.50 in case of Scheduled Tribe/Scheduled Caste candidates) payable to the "North-Eastern Hill University", Shillong as application fee.

NOTE

- Persons in service should submit their application through their employers.
- Candidates called for interview will have to appear before the Selection Committee at the Office of the North-Eastern Hill University or at any place specified. A return second class railway fare shall be paid by the University from the place of start to place of interview and back.
- All appointments will be subject to a period of probation.
- These posts are open to all citizens of India who satisfy the required qualifications but some preference may be given to equally qualified Scheduled Caste/Scheduled Tribe candidates.
- The University reserves the right to make appointments under Statute 21 of the Act, if necessary.

R. Kharlukhi
REGISTRAR

NARENDRA DEV UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

FAIZABAD-224001 (U.P.)

Advertisement No. 5/1979

Applications are invited for the following posts under this University on the prescribed form obtainable from the undersigned by sending a crossed postal order of Re. 1/- endorsed in favour of Comptroller, N.D. University of Agriculture and Technology, Faizabad along with self addressed envelope stamped for Rs. 3.30. The form duly filed in should reach the office of the undersigned positively on or before 31.10.1979 along with a crossed postal order of Rs. 10/- in case of general candidates and of Rs. 6/- in case of S.C./S.T. candidates endorsed in favour of the Comptroller, N.D. University of Agriculture and Technology, Faizabad. Higher starting salary in case of well deserving candidate is permissible. Candidates having more than one third class in their entire academic career are likely to be rejected. Scheduled Caste/Scheduled Tribe or Backward class candidates will be given preference in case found suitable.

Applications received without application fee in shape of postal order as mentioned above will be rejected.

1. Assistant Vegetable Breeder

(One) in the pay scale of Rs. 550-1200.

Essential Qualification

At least 2nd Class B.Sc. (Ag), 2nd Class M.Sc. (Ag) in Vegetable Crops/Horticulture (Olericulture)/Genetics and Plant Breeding with specialisation in Vegetable Breeding with three years' experience in Teaching/Research/Extension Education in particular subject OR Ph.D. with one year's experience in the subject.

Desirable Qualification

Aptitude to work in rural areas.

2. Assistant Librarian

(One) in the pay scale of Rs 550-1200.

Essential Qualification

At least 2nd Class Bachelor's Degree with Diploma/Degree (B.Lib.) in Library Science with five years' experience for Diploma holders Or three years' experience for Degree holders in Library Science in the relevant field.

Desirable Qualification

1. At least 2nd Class Master's Degree in Library Science OR in relevant field. The experience of work in the Library of a University/Institute/Council Or any other organisation of repute.

3. Subject Matter Specialist (Plant Protection)

(One) in the pay scale of Rs. 550-1200.

Essential Qualification

At least 2nd Class B.Sc./B.Sc. (Ag), 2nd Class M.Sc./M.Sc. (Ag) in Entomology Or Plant Pathology, with three years' experience in Teaching/Research/Extension Education in Entomology/Plant Pathology Or Ph.D. with one year's experience in the particular subject.

Desirable Qualification

- Aptitude to work in rural areas.
- Field experience of work with farmers in Plant Protection.

4. Assistant Engineer (Electrical)

(One) in the pay scale of Rs. 550-1200.

Essential Qualification

At least Bachelor's degree in Electrical Engineering of a recognised University, preferably with two years experience of electrical work in the Govt./Semi Govt./University or any reputed organisation.

Desirable Qualification

Aptitude to work in rural areas.

5. Subject Matter Specialist (Agriculture Engineering)

(One) in the pay scale of Rs. 550-1200.

Essential Qualification

At least 2nd Class B.Sc. (Ag) in Agricultural Engineering/B. Tech. with three years' experience in Teaching/Research/Extension Education Or M.Tech./M.Sc. (Ag) in Agricultural Engineering with one year's experience in the subject.

Desirable Qualification

Rural background and aptitude to work with farm community.

S.N. Tripathi
Administrative Officer

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